#### DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

# RCRA Corrective Action Environmental Indicator (EI) RCRAInfo code (CA725)

### **Current Human Exposures Under Control**

Facility Name:	914th Airlift Wing AFRC
Facility Address:	2720 Kirkbridge Drive, Niagara Falls IAP-ARS, NY 14304-5001
Facility EPA ID #:	NY0570024273
groun dwater, surfac	levant/significant information on known and reasonably suspected releases to soil, see water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been <b>considered</b> in this EI
_ <u>X</u> If yes	s - check here and continue with #2 below.
If no -	re-evaluate existing data, or
if data	are not available skip to #6 and enter"IN" (more information needed) status code.

## **BACKGROUND**

# **Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

#### Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

## Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

# **Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "contaminated" above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SW MUs, RUs or A OCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Several VOCs above levels of concern
Air (indoors)2		X		
Surface Soil				TCE above level of concern
(e.g., <2 ft)	X			
Surface Water		X		No compounds above levels of concern
Sediment	X			Three BNAs above levels of concern
Subsurf. Soil				VOCs above levels of concern
(e.g., >2 ft)	X			
Air (outdoors)		X		

		If no (for all media) - skip to #6, and enter "Y E," status code after providing or citing appropriat "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.
	<u>X</u>	If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.
comp lete	represe	If unknown (for any media) - skip to #6 and enter "IN" status code. (In order to present a more entation of the status of the site, the reviewer has chosen not to skip to #6.)

Rationale and Reference(s):

Media	Contaminant	Level of Concern	Max. Detected	Times above Std	Location
Groundwater	Benzene	1 mg/L	570 m g/L	570	IRP Site 10
Groundwater	Carbon tetrachloride	5 mg/L	2400 m g/L	480	IRP Site 3
Groundwater	Chloroform	7 mg/L	1500 m g/L	214	IRP Site3
Groundwater	1,1-DCA	0.6 mg/L	25 mg/L	42	IRP Site 13
Groundwater	1,2-DCA	0.6 mg/L	92 mg/L	153	IRP Site 10
Groundwater	1,1-DCE	5 mg/L	220 mg/L	44	IRP Site 10
Groundwater	Cis-1,2-DCE	5 mg/L	110000 mg/L	22000	IRP Site 10
Groundwater	Trans-1,2-DCE	5 mg/L	450 m g/L	42	IRP Site 10
Groundwater	1,2- Dichloropropane	1 mg/L	25 mg/L	25	IRP Site 13
Groundwater	Ethylbenzene	5 mg/L	270 m g/L	54	IRP Site 7
Groundwater	Tetrachloroethen e	5 mg/L	25 mg/L	5	IRP Site 13
Groundwater	Toluene	5 mg/L	280 m g/L	56	IRP Site 10
Groundwater	1,1,2-TCA	1 mg/L	25 mg/L	25	IRP Site 13
Groundwater	TCE	5 mg/L	79700 mg/L	15940	IRP Site 10
Groundwater	Vinyl chloride	2 mg/L	1600 m g/L	800	IRP Sites 10 &13

Groundwater	Xylenes, total	5 mg/L	92.3 mg/L	18	IRP Site 10
Surface soil	TCE	1000 mg/kg	700 mg/kg	1	IRP Site 10
Sediment	Benzo(a) Anthracene	612 mg/kg	960 mg/kg	2	IRP Site 10
Sediment	Benzo(a)pyrene	66.3 mg/kg	910 mg/kg	14	IRP Site 10
Sediment	Chrysene	66.3 mg/kg	1000 mg/kg	15	IRP Site 10
Subsurface soil	Cis-1,2-DCE	300 mg/kg	738 mg/kg	2.46	IRP Site 5
Subsurface soil	TCE	700 mg/kg	87800 mg/kg	125	IRP Site 5

On September 9, 2000, indoor air samples were collected in buildings 904, 912, and 920. These three buildings have the potential to be impacted by contaminated groundwater. It should be noted that Building 920 is an active vehicle maintenance shop. Two air samples were taken in each of these buildings using six-liter Summa® Canisters. The samples were analyzed according to EPA Method TO-14 using GC/MS in the full scan mode. As indicated in the table, 17 compounds were identified. The table includes the highest result for each compound reported in the laboratory report. All of the compounds were found to be at concentrations well below current occupational exposure levels.

## Comparison of Indoor Air Monitoring Results

Results	Occup ational	Exposure	Values	Air Monitoring Results
		TWA in mg/m3		Highest
	OSHA	ACGIH	NIOSH	Reported Value
Compound	PEL	TLV	REL	(mg/m3)
Freon 12 (Dichlorodifluoromethane)	4945	4945	4945	0.018
Freon 11 (Fluorotrichloromethane)	5618	5618 (C)	5618 (C)	0.17
Benzene	3	2	0.3	0.018
Toluene	754	188	377	0.13
1,1,2,2 Tetrachloroethene	34	7	7	0.082
Ethyl Benzene	434	434	434	0.017
m,p-xylenes	1303	1303	1303	0.061
o-xylene	1303	1303	1303	0.02
1,3,5-Trimethylbenzene	123	123	98	0.0051
1,2,4-Trimethylbenzene	123	123	98	0.018
Acetone	2375	1188	594	0.042
Hexane	1762	176	176	0.028
4-Ethyltoluene	NE	NE	NE	0.018
Ethanol	1884	1884	1884	0.12 B
1,4 Dichlorobenzene	451	60	NE	0.068
2 Propanol	983	983	983	0.017

Chloromethane	206	103	NE	0.0084

TWA = Time Weighted Average
OSHA PEL = Occupational Safety and
Health Administration Permissible Exposure
Limit
ACGIH TLV - American Conference of
Governmental Industrial Hygienists
Threshold Limit Value
NIOSH REL = National Institute for
Occupational Safety and Health
Recommended Exposure Level
NE = Not Established
(C) = Ceiling Value
B = Detected in Blank

#### References:

Ecology and Environment, Inc., July 2000, 2000 Internal Draft Sampling/Monitoring Report Installation-Wide Groundwater Monitoring Project, Niagara Falls Air Reserve Station, Lancaster, New York.

Air Toxics LTD., 2000, Laboratory Report for Work Order #0009123

#### Footnotes:

1"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or so lids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

2Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

#### Potential Human Receptors (Under Current Conditions)

Contaminated Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	No	No	No	No			No
Air (indoors)	No	No	No				
Soil (surface, e.g., <2 ft)	No	No	No	No	No	No	No
Surface Water	No	No	No-	No	No	No	No
Sediment	No	No			No	No	No
Soil (subsurface e.g., >2 ft)				No			No
Air (outdoors)	No	No	No	No	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

- 1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.
- 2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human R eceptor combinations (Pathways) do not have check spaces ("\_\_\_"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_ <u>X</u>	If no (pathways are not complete for any contaminated media-receptor combination) –skip to #6 and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
	If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.
	If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and ente "IN" status code.

#### Rationale and Reference(s):

There are residential areas near the site, however, the presence of base security and physical barriers (e.g., the surrounding fence and the airport runways to the south) prevent casual access to the site by these residents, or by trespassers. There are no day-care facilities on base, and no food items are produced or grown on base. Therefore, there are no pathways between "contamination" and residents, day-care, trespassers, or food.

Recreation areas on the base are limited to a baseball field and a jogging track. These are both located just inside of the main gate near IRP Site 8. This area is used by visitors as well as base personnel, but visitors generally do not venture outside of this recreational area. Cayuga Creek and its unnamed tributaries flow across the base, but neither is used for fishing or other recreational purposes.

Groundwater is not a current or likely future source of drinking water, therefore, there is no pathway between "contamination" and human receptors, such as base and construction workers.

Exposure to contaminated sediment at IRP Site 10 is not feasible as it is in a highly controlled area. The area of sediment at site 10 is located in a drainage ditch which workers do not enter.

Exposure of construction workers to contaminated surface and subsurface soil is controlled through the digging permit process. Any time someone wants to dig up the ground, they must first fill out an AF Form 103, Base Civil Engineering Work Clearance Request, for permission to dig. At that time, the area being dug up is checked against known areas of contamination. The base does not allow any construction in the areas of contamination.

Due to the site conditions and the age of the sites, contaminant releases to outdoor air were considered to be insignificant. At Site 3, the landfill has been capped and most contamination occurs in the bedrock aquifer beneath 10 feet of low permeable soils. At Site 5, the majority of contaminants are found in a sand lens which is encapsulated by low permeable soils. The area around Site 10 is restricted as it is located at the end of a runway. The area in the vicinity of Site 13 is entirely paved.

#### References:

Ecology and Environment, Inc., June 1999, Draft 1999 Sampling/Monitoring Report, Installation-Wide Groundwater Monitoring Project, Niagara Falls IAP-ARS, Lancaster, New York.

\_\_\_\_\_, June 1999, Final 1998 Sampling/Monitoring Report, Installation-Wide Groundwater Monitoring Project, Niagara Falls IAP-ARS, Lancaster, New York.

<sup>&</sup>lt;sup>3</sup>Indirect Pathway/R eceptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4.	Can the <b>exposures</b> from any of the complete pathways identified in #3 be reasonably expected to be "significant" (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?
	X If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."
	If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."
	If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

## Site 3, Landfill

Rationale and Reference(s):

The landfill is located at the east end of the base and was used from 1952 to 1969. The landfill is covered with approximately 3 feet of clay so there isn't any exposure to the soil. The only people who frequent this area are grounds keepers who cut the grass on a regular basis. Cayuga Creek is located at the southern edge of the landfill and is down gradient. Cayuga Creek is sampled twice a year for VOCs and none have been detected over the past 5 years. Also, three pumping wells, along with a 150 foot long groundwater recovery trench was installed adjacent and parallel to Cayuga Creek to prevent contamination from migrating into the creek. In addition, neither Cayuga Creek nor the groundwater in and around the base is used as a source of drinking water. The groundwater results from the March 2000 sampling event were:

		Level of			
Media	Contaminant	Concern	Max. Detected	Times above Std	Location
Groundwater	Cis-1,2-DCE	5ug/L	59 ug/L	12	IRP Site 3
Groundwater	Chloroform	7 ug/L	8 ug/L	1	IRP Site 3
Groundwater	Trichloroethylene	5 ug/L	10 ug/L	2	IRP Site 3
Groundwater	Vinyl Chloride	2 ug/L	12 ug/L	6	IRP Site 3
Groundwater	Carbon Tetrachloride	5 ug/L	19 ug/L	4	IRP Site 3

## Site 5, Former Hazardous Waste Drum Storage Yard

Site 5 is within the Air National Guard area in the northern portion of the base. The site, at the abandoned BOM ARC missile site, consisted of a concrete pad that was used for drum storage from 1978 to 1983. The concrete pad was cleaned in 1983 in accordance with a New York State Department of Environmental Conservation approved closure plan. Four overburden wells were installed and sampled in 1986 and analytical results indicated the presence of oil and grease, total organic carbon, purgeable organic carbon, total organic halides, and lead.

During 1995-1999, several monitoring wells were installed to determine the horizontal and vertical extent of contamination. During the 1997 sampling event, TCE showed up in a well that was significantly higher than previously detected. A focused RI was initiated in 1998 to further delineate and characterize the site. The study

found a sand lens under the site that contained elevated levels of TCE and breakdown products. The groundwater results from the March 2000 sampling event were:

Media	Contaminant	Level of Concern	Max. Detected	Times above Std	Location
Groundwater	Cis-1,2-DCE	5 ug/L	4270 u g/L	854	IRP Site 5
Groundwater	Trans-1,2-DCE	5 ug/L	30 ug/L	6	IRP Site 5
Groundwater	Trichloroethylene	5 ug/L	70000 ug/L	14000	IRP Site 5
Groundwater	Vinyl Chloride	2 ug/L	8 ug/L	4	IRP Site 5

The recommendation from the focused RI was to recover as much product as possible from the sand lens by installing four recovery wells. Then, follow-up with the injection of amendments to speed up the process of biodegradation. This project has been designed and the corrective measures are being implemented

## IRP Sites 7 and 8

These sites are under a program of long term monitoring. The contaminant distributions are in a steady state condition.

#### IRP Site 10, Fire Training Pit

The fire training pit was used from 1955 to 1963. Waste fuels, oils, solvents, and hydraulic fluid were disposed of and burned as part of fire training exercises. In August 1996, the fire training pit at this location was subjected to an Interim Remedial Action (IRA) known as six-phase soil heating. This is a process where the soil is heated to 200 degrees Fahrenheit to volatilize the contaminants in the ground. The volatilized contaminants are then captured at the ground surface using a soil vapor extraction (SVE) system and then run through granulated activated carbon. The IRA removed an estimated 60 kilograms of TCE and products of TCE degradation, and nearly 5 kilograms of BTEX compounds from the site, as measured in the off-gas of the SVE system. The post sampling results taken in September 1997 were:

		Level of			
Media	Contaminant	Concern	Max. Detected	Times above Std	Location
Soil (>2 ft)*	Cis-1,2-DCE	No current standard	1600 mg/kg	NA	IRP Site 10
Soil (>2 ft)*	Trichloroethylene	700 ug/kg	2400 mg/kg	3.4	IRP Site 10
Groundwater	Cis-1,2-DCE	5 ug/L	120000 ug/L	24000	IRP Site 10
Groundwater	Trans-1,2-DCE	5 ug/L	460 ug/L	92	IRP Site 10
Groundwater	Trichloroethylene	5 ug/L	190000 ug/L 38000		IRP Site 10
Groundwater Vinyl Chloride		2 ug/L	6100 u g/L	3050	IRP Site 10

The post treatment results, however, showed an accumulation of TCE in the groundwater at the overburden/bedrock surface (approx 9 feet deep). A 125 foot long, 11 foot deep (to the top of bedrock) groundwater recovery trench was installed down gradient of the fire training pit to collect the groundwater and discharge it to the sanitary sewer.

Groundwater results from the March 2000 sampling event show the maximum levels of contaminants were:

		Level of			
Media	Contaminant	Concern	Max. Detected	Times above Std	Location
Groundwater Cis-1,2-DCE		5ug/L	19000 ug/L	3800	IRP Site 10
Groundwater	Groundwater Trans-1,2-DCE		169 ug/L	34	IRP Site 10
Groundwater Trichloroethyl		5 ug/L	28800 ug/L	5760	IRP Site 10
Groundwater Vinyl Chloride		2 ug/L	505 ug/L	252	IRP Site 10

Site 10 is located in a controlled area on the airfield. The only people who go to this site are the groundskeepers who cut the grass twice a year.

## Site 13, Underground Tank

Site 13 was a former underground tank that was originally used for automotive gasoline for a gas station. When the gas station closed, the tank was converted to a slop tank where solvents, jet fuel, and used oils were disposed of. In December 1986 the tank was pumped out, excavated, and removed. The pit was backfilled in December 1987. The standing water in the pit contained elevated levels of tetrachlorethylene and TCE. Studies were done over the next several years to determine the horizontal and vertical extent of the contamination. In Spring 1998 two recovery wells were installed to minimize the migration of any contaminants. Tthe groundwater results from the March 2000 sampling event were:

Media	Contaminant	Level of Concern	Max. Detected	Times above Std	Location
Groundwater	Cis-1,2-DCE	5ug/L	107 ug/L	21	IRP Site 13
Groundwater	Groundwater Tetracloroethylene		6 ug/L	1	IRP Site 13
Groundwater	Trichloroethylene	5 ug/L	113 ug/L	23	IRP Site 13
Groundwater Vinyl Chloride		2 ug/L	20 ug/L	10	IRP Site 13

#### References:

Montgomery Watson, September 1997, Niagara Falls IRP-ARS Management Action Plan, Malvern, Pennsylvania.

Montgomery Watson, August 1998, Site 10, Fire Training Area No. 1 Final DNAPL Investigation Report, Niagara Falls IAP-ARS, Malvern, Pennsylvania.

Ecology and Environment, Inc., 2000 Internal Draft Sampling/Monitoring Report, Installation-Wide Groundwater Monitoring Project, Niagara Falls IAP-ARS, Lancaster, New York.

Ecology and Environment, Inc, May 2000, Focused RCRA Facility Investigation and Interim Corrective Measures Study Site 5, Niagarra Falls IAP-ARS, Lancaster, New York.

<sup>4</sup>If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

<sup>\*</sup>New York State Soil Cleanup Objectives to Protect Groundwater Quality

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5. Can	the "significant" exposures (identified in #4) be shown to be within acceptable limits?
-	X If yes (all "significant" exposures have been shown to be within acceptable limits) -continue and enter "Y E" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
-	If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure
-	If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.
Rational	e and Reference(s):
	See discussion above.

# **Current Human Exposures Under Control**

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(CA275)., a	and obtain Sup	RIS status codes for the Current Human Exposures Under Control EI event code ervisor (or appropriate Manager) signature and date on the EI determination below pporting documentation as well as a map of the facility):
X	the informat to be " Undo NY05700242 and reasonal	"Current Human Exposures Under Control" has been verified. Based on a review of ion contained in this EI Determination, "Current Human Exposures" are expected er Control" at the Niagara Falls IAP-ARS facility, EPA ID# 273,located at 2405 Franklin Drive, Niagara Falls ARS, New York, under current by expected conditions. This determination will be re-evaluated when the e becomes aware of significant changes at the facility.
	NO – "Curre	nt Human Exposures" are NOT "Under Control."
	IN – More in	nformation is needed to make a determination.
		man exposures to groundwater and soil contamination are under uman exposures from indoor air quality are below applicable
Completed b	y (signature) (print) (title)	Stanley F. Radon Senior Engineering Geologist
Supervisor	(signature) (print) (title) (EPA Regio	James Strickland Regional Hazardous Materials Engineer n or State) NYSDEC, Region 9.
Approved by	v: (signature)	
	(print) _ (title) _ _	Paul J. Merges, Ph.D.  Director, Bureau of Radiation & Hazardous Site Management  NYSDEC, Albany
Locations w	here Reference	es may be found:
<ul><li>2. Nia</li><li>3. New</li></ul>	gara Falls Publ	Building 403, 2405 Franklin Drive, Niagara Falls IAP-ARS, NY 14304-5063 lic Library, 1425 Main Street, Niagara Falls, NY 14305 epartment of Environmental Conservation, Region 9, 270 Michigan Avenue, 103-2999
Contact teles	phone number	
	Stanley Rade #) (716)851-	

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENT OF RISK.